INTERIM GUIDELINES FOR MONITORING NONGAME LANDBIRDS ON NATIONAL WILDLIFE REFUGE SYSTEM LANDS IN USFWS REGION 6

Stephanie L. Jones, U.S. Fish and Wildlife Service, Nongame Migratory Bird Coordinator, P.O. Box 25486 DFC, Denver, CO 80225 (303) 236-8676 FAX (303) 236-8086

INTRODUCTION

Monitoring the abundance, demographics, and long-term trends of bird populations is a means to assess the need for management and research, evaluate management priorities, and determine the success or failure of conservation efforts. As the primary Federal agency responsible for migratory bird protection and management, the Fish and Wildlife Service (FWS) has an important legal mandate to conserve avian diversity in North America (USFWS 1990). This includes maintaining populations of all native migratory bird species and their essential habitats at viable populations levels. To determine if this mandate is being met, FWS must assess the status and trends of all migratory bird species, subspecies, and populations. This requires data from monitoring at a number of scales, including hemispheric, national, regional, and local (Butcher 1992). Monitoring species at the local, regional, and even at the national level may not contribute to an assessment of continental populations, but may be important in determining the status of local populations. It is an important component of this monitoring system to identify the dynamics of local populations. Presence and absence information may not be enough to determine the health of a population.

Management of species, populations, and habitats occurs at scattered local sites. At whatever scale monitoring is conducted, the data produced should be useful and meaningful for both management and research programs. The population changes detected should help determine which species should receive increased emphasis for conservation actions or research. Standardization of techniques will allow for comparison and compilation with other data, comparison with data between years, habitat, geographic areas, and observers, and increased statistical validity.

The purpose of this document is to establish a framework for inventorying and monitoring nongame birds (primarily passerine landbirds) on National Wildlife Refuge System lands, which includes national wildlife refuges and wetland management districts (hereafter referred to as refuges). The goal of refuge monitoring is to: (1) monitor relative abundance of all bird species to assess trends; (2) define avian habitat and ecosystem relationships; (3) determine how management activities influence bird abundance and distribution; (4) provide data that could be used to plan management activities to accommodate a variety of bird species, especially those with specific habitat needs or declining populations; (5) evaluate the accomplishment of refuge objectives; and (6) contribute to a regional or a national monitoring program.

FWS is unique among federal lands agencies because of its different responsibilities. Therefore, FWS is responsible for conserving migratory birds throughout the nation, and for the local management of the refuge system. FWS is responsible for national monitoring. Refuges are also unique among federal lands in that they are designed to protect and provide critical and unique habitat for wildlife. Many refuges have a legal mandate to manage and

protect migratory birds; throughout the nation, eighty-four percent of national wildlife refuges have the conservation of all migratory birds (not just waterfowl) as part of their enabling legislation (USFWS 1988).

There is a need by refuge managers for baseline information to measure how well the legal, political, and biological obligations are being met. However, it is important that monitoring activities also be tied the needs and objectives of the individual refuges. There is value in collecting occurrence, distribution, status, and habitat use information for all species that use the refuge. These interim guidelines target the breeding season, partly because of the increased reliability breeding season data. Using the breeding season for avian species will give data with less yearly variation. This is not to imply that other seasons are not important and surveys for migration and winter seasons will be addressed in other documents, as standards are adopted. The baseline data acquired be used to evaluate later questions regarding species current and historical status, and can be consulted when management actions are proposed (S. Droege, written commun.).

Using standard methods on refuges can provide local data to meet individual refuge needs, as well as contribute to a regional program. The refuge monitoring program is not meant to be a national monitoring program, however; by using standardized techniques refuges can contribute to national programs Ralph and Scott 1981, Verner 1985, and Ralph et al MS), including the *Partners in Flight* Monitoring Working Group *Needs Assessment* (Butcher 1992).

NATIONAL MONITORING

The Breeding Bird Survey (BBS) is a FWS national monitoring program coordinated by the FWS (Robbins et al. 1986), and the first priority of any FWS scheme for a national and regional monitoring system for nongame birds is to strengthen the BBS. Much of the national or regional information we have about the status of many nongame birds comes from the BBS; without this survey no information would exist for many nongame species. Refuges benefit directly from BBS information, as it allows them to assess trends and refuge importance on the regional landscape (Robbins et al 1986; Peterjohn and Sauer 1992). Refuges should encourage participation in this survey by qualified personnel. Refuges could participate in the BBS by providing qualified personnel to run a BBS route or by providing logistical support for qualified volunteers to do to. Refuges interested in participating in the BBS should contact their Regional Nongame Coordinator to determine where BBS assistance is needed or to get the name of their state coordinator.

Constant-effort mist netting (such as Monitoring Avian Productivity and Survivorship (MAPS) DeSante 1991) is currently being tested to determine its utility as a demographic oriented national monitoring system. The Office of Migratory Bird Management will evaluate MAPS data over a four-year period to decide the program's feasibility, usefulness, and future applicability to refuges and as a national monitoring program. Refuges could become sites for MAPS, acquiring data for the refuge and contributing to the national program.

Refuge monitoring should be tied to a regional reporting system, such as the proposed National or Regional Data Center(s) (C. J. Ralph, written commun.) or the Refuge Management Information System (S. Droege, written commun.), which will present the data

in a useable, reportable manner. Monitoring and data analyses can be linked on a regional or national basis, by using standard data collection. Regional data analysis, as well as data collection, needs to be an important component of a regional refuge monitoring program. However, regional and national data centers should not be used to override the need for local data analysis and use. It is critically important that refuges have the capability to summarize and analyze the data themselves and use it in their management.

REFUGE MONITORING GUIDELINES

As proposed here, nongame birds will be inventoried and monitored using a three tiered system that will allow sites, including refuges, to determine the status and trends of species based on their needs and resources. However, a refuge monitoring program should meet certain standards, including refuge information needs, support to a regional data base, and standard techniques.

Level 1 - Determining species occurrence and distribution.

Determining species presence or absence and seasonal status for checklists, breeding bird atlases, and basic vegetation maps.

A map with a standardized vegetation classification system should be used to correlate avian presence or absence data with habitat. There are many schemes to facilitate acquisition of this presence or absence information, including Area Search method described in Ralph et al. MS, Christmas Bird Counts, Breeding Bird Counts, Winter Bird Population Counts, Migration Counts, and Checklists. However, even when tied to habitat these methods give only limited information about densities, abundances, or population trends and demographics. These inventories can be useful to a refuge in locating species and areas for more intense monitoring or research projects; to acquire data on population status and trends, refuges need to monitor using the techniques discussed in levels 2 and 3. Level 1 is the foundation for any nongame refuge programs and monitoring, and should end up looking like a low-intensity level 2 program. Level 1 activity is expected of each refuge as the foundation upon which we will build the monitoring program. Checklists and inventory data is available for many of the refuges in Region 6. It is the current challenge of the FWS to take conservation of nongame landbirds to the next level on FWS lands.

Level 2 - Determining population abundance, trends and demographics.

Determining avian abundances, population trends, densities, or demographics using standard methods.

This is the basic level for avian monitoring. Level 2 monitoring is also designed to give early indications of potential problems, triggering the need for the intensive focus of a research program (Level 3). A description of these techniques is also given in Ralph et al. (MS) and (Butcher 1992). The techniques recommended for a Region 6 refuge monitoring program are point counts (Reynolds, Scott and Nussbaum 1980), constant effort mist-netting (MAPS, DeSante 1991) and nest search (Martin and Geupel in press). An excellent discussion of the biases, potentials, comparisons, and constraints of counting techniques for ornithological monitoring can be found in Verner (1985) and Hutto (1986). The Burnham

and Anderson (1984) TRANSECT methodology, now available as DISTANCE, continues to be recommended as the statistical standard for population estimation.

Standardization is the key to a local project contributing to a regional monitoring program. Currently, most authors recommend certain standards for a expanded nongame monitoring program, and these precise guidelines and standards for Region 6 are below.

Level 3 - Extensive and intensive monitoring and research.

The third level includes species and population demographics, including research projects to understand the status of a species or guild in an priority area or habitat. This level could be used to answer questions such as what are the factors limiting the population, what is influencing local population trends, etc. The techniques used here include total and spot mapping, radio telemetry, laboratory testing, and other research techniques. This level of research should only be applied to select species, seasons, and habitats of special interest to the refuge or researcher.

Standards for point counts, constant efforts mist netting, nest searching, and vegetation measurement FWS, Region 6.

More information about techniques and copies of the reference cited are available from the Regional Nongame Coordinator. Point counts and vegetation assessment are the basis and the beginning of the monitoring program. For both the mist-netting and nest searching, point counts are included in the plots, and all techniques use vegetation assessment.

Point Counts. A minimum of 100 point per type (i.e. vegetation type) or area/refuge is necessary for increased statistical validity, with a maximum of about 350 per type. After collecting initial data, use power statistics to determine number of stations required for the area (Brower and Zar 1984).

Point counts should be 8 minutes for counts on secondary roads and 10 minutes for off-road trails and wilderness counts, marking the 5 minute point. All point count stations should be a minimum of 200 m apart. All point counts should have a distance component, whether fixed radius (Hutto 1986) or variable radius with distance estimates to all detections (Reynolds, Scott and Nussbaum 1980; Burnham and Anderson 1984). The fixed radius is recommended, for a variety of reasons, including the variability of distance estimation in untrained observers.

All point count stations should include a random component in their location. It is critical that the sampling scheme be random at some level or most statistical tests will be invalid, since random sampling will allow for the assumption of independence. The assumption of randomness in the sampling is the only statistical error that, if violated, is both serious and impossible to correct after the data have been collected (Green 1979). Suggested methods for achieving some level of randomness in a stratified sample include: (1) random starting points and directions for the transects, or (2) establishing a minimum distance between stations (ie; 200 m) and then using a random number table between 0-50 m to establish the station. Other methods exist for establishing random stations (Hutto 1986).

All observers should be able to identify by sight and sound all species likely to be encountered, and training sessions should be utilized to facilitate this objective (Kepler and Scott 1981; Appendix E).

All stations need to be permanently marked, and clear directions and maps used to locate stations during the later years. These markers will assist both in reducing observer viability and with habitat monitoring assessments. It is critical to the validity of the technique that the same stations be used in all years.

All counts should be start within 15 minutes of local sunrise, and finish within 3-4 hours. Counts should not be done during winds, rain, or other inclement weather (Verner 1985; Ralph et al. 1992). Point count stations should not be set up on primary roads, and if possible be located off-roads or on secondary roads (R. Hutto, written commun). Counts should be replicated 2-4 times during the breeding season.

Constant effort mist-netting. Constant effort mist-netting techniques have been standardized in the Monitoring Avian Productivity and Survivorship Program (MAPS, DeSante 1991). A series of 10-12 mist-nets should be arrayed in each station. The nets should be run one day in ten during the breeding season, from May-August. There are 12 10-day periods in the breeding season and the nets should be run for at least 10 of these periods. The start period will vary depending on the latitude, elevation, and other aspects of the plot. Nets should be placed between 75-100 m apart, and all nets should be able to be checked within .75 hour.

Nets should be in the same location and orientation for all 10-day intervals, and in succeeding years. Baiting, artificial water, or tape-lures absolutely should not be used.

Use nets 12 m long x 2.5 m high, with a 30 mm or 36 mm mesh. Nets should be opened within 15 minutes of local sunrise and operated for 4-6 hours a day.

All banding must be done with the proper USFWS permits. Collect standardized data, as recommended by MAPS and in Ralph, et al. (in press). All constant effort mist-netting stations need to incorporate point counts and vegetation assessment within the plot.

Nest Searching. Nest searching plots should be established in vegetation types or habitats of special concern. Twenty-five hectare or larger area plots should be established. The plots should be marked in a grid pattern to facilitate random search and re-location of nests, but never use flagging or other visible markers to marks nests as these may increase the risk of predation. To obtain a sufficient sample size per species to estimate nesting success, nest searching should concentrate on the species of concern in the study area.

Nest finding should begin early in the breeding season, as soon as territories are established. Observers should visit the sites early in the season to ensure early nests are not missed in 'unusual' years.

Nests should be located during nest construction, if possible. This will minimize disturbance, reduce the chance of predation, or parasitism, and allow for the best estimates of nest success. The most effective way of finding nests is by locating and following individuals building nets. Nests of some species can be found by random search or listening for flushing. Behavioral clues and observation are the best methods for finding nests, and

difference stages of the reproductive process can be used to find nests. See Martin and Geupel (in press) for a in depth discussion on nest locating and monitoring.

A nest should be checked a minimum of 3 to 4 days to determine if it is still active or if it has failed. More frequent nest checks are helpful to determine nest fate, and incubation period. This information is necessary to calculate nest success using the Mayfield method (Mayfield 1961, 1975).

Detailed daily nest check forms or cards and summary nest data sheets should be completed for all nests (Tables 1 and 2). The daily nest forms should include a detailed description of the nest site and a map. This description should be sufficiently detailed that anyone can locate the nests in the future. Point counts, using the recommended methods and techniques outlined above, should be conducted on the nest plots, 3 times per year.

Vegetation measurements. All avian monitoring techniques should have some method of measuring the habitat and vegetation, and many strong techniques are available (James and Shugart 1970; Noon 1981; Larson and Bock 1986). Since this monitoring program on refuges will be habitat based, habitat mapping and classification are critical and should be uniform across all refuges. The basis for habitat and vegetation assessment and monitoring will be a refuge vegetation map and classification system.

All of the methods mentioned for avian monitoring will need to include a vegetation assessment system, and where appropriate monitoring changes in vegetation. The vegetation around each point count station (in all techniques) should be evaluated using this method (Table 3). Around the bird survey stations, the vegetation should be measured using a circular plot with a radius of 11.3 m. The station would be the center of the plot. For roadside counts, move off the road 15 m and put one plot at each station. These could be done in the afternoon, after the bird surveys.

Methods and techniques for vegetation measurements:

TREES/SNAGS. Measure and record the DBH (diameter at breast height), the species, and height of all trees greater that 15.4 cm (6 inches) in diameter inside the plot. Measure the distance from the center of the plot to the nearest tree and snag in each quarter.

LOGS/DEAD AND DOWN WOODY MATERIAL. Measure the diameter of the largest end of all logs with a diameter greater than 15.4 cm (6 inches), record this diameter, species, and length. Measure the distance from the center of the plot to the nearest log in each quarter.

SHRUBS. Establish two perpendicular 26.6 m line transects, through the center of the plot. Walk along the transects, counting the number of secondary woody stems intercepted by your outstretched arms. Record the species of all shrubs encountered. Record the number of dead stems intercepted, and estimated the percent of the shrubs that consists of dead material.

FORBS, FERNS, GRASSES. Using the two line transects established above, select two random directions. This will result in two 11.3 m transects. In these two transects, record the species of life form and the aerial distance of all plants intercepted within 5 cm of the line (Brower and Zar 1984). Measure the depth of the vegetative litter at 5 meter intervals, and record this interval.

OTHER. Record the canopy cover for the entire plots, the vegetation type, percent ground cover, slope, aspect, and any habitat attributes and cover type present (such as rocks, cliffs, seeps, meadows, streams, etc.).

Within the nest search plot, vegetation will be measured using the above method around the point count stations. Other random sites would be selected for vegetation assessment to increase the percent sampled within 10%. Each nest site should be described using a method modified from Larson and Bock (1986), recording the variables in Table 3. Each nest site should be paired with a random place and height inside of the plot, and the same nest variables measured.

ACKNOWLEDGEMENTS

I would especially like to thank Steve Lewis, Fritz Knopf, C. J. Ralph, John Sauer, J. Scott Dieni, Steve Martin, John Cornely, David Anderson, Geoff Geupel, Dick Roth, Mike Carter, and Bruce Peterjohn for their insightful reviews of this document and for providing discussion and assistance with the ideas and writing. Middy Hetrick, Dick Hutto, John Trapp, Jared Verner, Elizabeth Cummings, Mike Bryant, Sam Droege, and Karen Smith reviewed the early drafts, and supplied comments.

REFERENCES

Brower, J.E. and J.H. Zar. 1984. Field and laboratory methods for general ecology. W.C. Brown, Dubuque, IA. 226 pp.

Burnham, K. P. and D. R. Anderson. 1984. The need for distance data in transect counts. J. Wildl. Manage. 48(4):1248-1254.

Butcher, G. S. 1992. Needs Assessment: monitoring neotropical migratory birds. Cornell, Laboratory of Ornithology and *Partners in Flight,* Monitoring Working Group. [Available from Greg Butcher, Cornell Laboratory of Ornithology, 159 Sapsucker Woods Road, Ithaca, NY 14850].

DeSante, D. F. 1991. The monitoring avian productivity and survivorship (MAPS) program. Institute for Bird Populations. [Available from IBP, Box 1346, Point Reyes Station, CA 94956].

Green, R.H. 1979. Sampling design and statistical methods for environmental biologists. John Wiley and Sons, New York.

Hutto, R. L., S. M. Pletscet, and P. Hendricks. 1986. A fixed-radius point count method for nonbreeding and breeding season use. Auk 103: 593-602.

James, F. C. and H. H. Shugart. 1970. A quantitative method of habitat description. Audubon Field Notes 24:727-736.

Kepler, C. B. and J. M. Scott. 1981. Reducing bird count variability by training observers. *In* C. J. Ralph and J. M. Scott, (eds.). Estimating numbers of terrestrial birds. Studies in Avian Biology 6:336-371.

Larson, D. L. and C. E. Bock. 1986. Determining avian habitat preference by bird--centered vegetation sampling. *In* J.Verner, C. J. Ralph, and M. L. Morrison (eds.) Wildlife 2000: Modeling habitat relationships of terrestrial vertebrates. University of Wisconsin Press, Madison, pp. 37-43.

Mayfield, H. F. 1961. Nesting success calculated from exposure. Wilson Bull. 73:255-261.

Mayfield, H. F. 1975. Suggestions for calculating nesting success. Wilson Bull. 87:456-466.

Martin, T. E. and G. R. Geupel. MS. Protocols for nest-monitoring plots: locating nests, monitoring success and measuring vegetation. J. Wildl. Manage. (in press).

Noon, B. R. 1981. Techniques for sampling avian habitats. *In* D. E. Capen (ed.), The use of multi-variate statistics in studies of wildlife habitat. USDA, Forest Service, GTR-RM 87, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Peterjohn, B. G. and J. R. Sauer. 1992. Population trends of neotropical migrant birds from the North American Breeding Bird Survey, 1966-1991. USDOI, Fish and Wildl. Serv., Patuxent Wildlife Research Center, Laurel, MD 20708.

Ralph, C. J. and M.J. Scott, eds. 1981. Estimating numbers of terrestrial birds. Studies in Avian Biol. 6:1-830.

Ralph, C. J., S. Droege, and J. R. Sauer. 1992. Managing and monitoring birds using point counts: standards and applications. USDA, Forest Service, unpublished document. [Available from C. J. Ralph, Redwood Sciences Lab., 1700 Bayview Drive, Arcata, CA 95521].

Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Noon, and D. F. DeSante. In press. Field methods for monitoring landbirds. USDA, Forest Service, General Technical Publication. (In press). [Available from C. J. Ralph, Redwood Sciences Lab., 1700 Bayview Drive, Arcata, CA 95521].

Reynolds, R. T., J. M. Scott, and R. A. Nussbaum. 1980. A variable circular-plot method for estimating bird numbers. Condor 82:309-313.

Robbins, C. S., D. Bystrak, and P.H. Geissler. 1986. The breeding bird survey: its first fifteen years, 1965-1979. USDOI, Fish and Wildl. Serv. Res. Publ. 157.

U.S. Fish and Wildlife Service. 1988. Management of the National Wildlife Refuges, Draft, Environmental Impact Statement. USDOI, Fish and Wildl. Serv., Washington, D.C.

U.S. Fish and Wildlife Service. 1990. Conservation of avian diversity in North America. Office of Migratory Bird Management, USDOI, Fish and Wildl. Serv., Washington, D.C.

Verner, J. 1985. Assessment of counting techniques. *In* R.F. Johnson (ed.) Current Ornithology 2:247-302. N.Y. Plenum Pub. Corp.

AREA SEARCH CENSUSES (DRAFT-USFWS REGION 6)

To Conduct an Area Search Census:

1) *Choosing a site*. Each site should be registered with the Regional Office (Nongame Migratory Bird Coordinator) and defined according to its current land use and habitat criteria (e.g. grazing, controlled burning, recreational, short-grass prairie, riparian woodland (deciduous), etc.). Habitat criteria should follow any standard classification system, such as Bailey's Ecoregions or Kuchler's "Potential Natural Vegetation", contact Stephanie Jones at the Region 6 office for questions on classification.

Each site should be large enough to encompass 3 separate plots (search areas). All 3 plots should be the exact same size and the same habitat type.

2) *Choosing a plot (search area)*. Each search area or plot must be in a single definable habitat type. For forested habitats, each search area should be about three hectares (e.g. 150m by 200m). Larger areas can be used in more open habitats, up to 10 hectares, however; the entire area should be adequately covered in 20 minutes. Plots may be of any shape. Search areas may have adjoining boundaries but in general should be 25 meters from edges of different habitats. A minimum of 3 areas should be covered in a single morning. The same exact area must be censused from year to year. Search areas should be marked out or described in detail in order that they can be relocated by another person. Topographic and habitat maps should be included when registering the sites.

3) *Conducting a census*. After a plot is established, cover the entire area in exactly 20 minutes. Feel free to stop or investigation songs, calls, or behavior, including breeding activity. Do not be distracted or spend too much time looking for a rare bird or nests. (If you are doing nest searches, do that after the 20 minute census). Please note that this time constraint is a extremely important component of the technique, if the data is to be used later for trends or monitoring. Record data as described on the following data sheet. Observations of important information not recorded in the 20 minutes, or off the plot may be included under notes or on a separate piece of paper.

Observers: Up to 4 observers per area is allowed. Observers should keep together, act as one observer, and record all observations on the same sheet (designate a recorder). At least 1 observer should be familiar with the identification, songs, and calls of all birds likely to be encountered. Encourage beginners to come along and get involved. HAVE FUN!!

4) *Frequency*. Each plot must be censused annually at approximately the same time of year during the breeding season. At least 2 censuses should be done per year, and ideally 3. Searches during fall and winter may also be useful.

It is important to adequately mark, map and register the site. Sites that are determined to be locally or regionally important may also be used for more quantitative monitoring, such as point counts, constant effort mist-netting, or nest searching (S.L. Jones, Region 6 Nongame monitoring guidelines) as more resources become available.

June 1993

Area Search Code KEY

Location: Mileage from nearest town and county.

Site: Specific name given to a series of one to twelve plots (each 3 to 10 hectares).

Plot #: Plot 1 through 12. Begin a new form for each plot.

UTM: Global Positioning System (GPS) unit of measure, if available.

Weather: (Censuses should not be conducted in bad weather)

TA: Temperature (Celsius) at time of census
Sky: Condition codes: 0= clear, few clouds, 1 = partly cloudy, scattered, 2 = mostly cloudy, broken, 3 = overcast, 4, = fog or smoke, 5 = drizzle, 7 = snow, 8 = showers.
Wind: Enter Beaufort numbers below, not m.p.h.

#	mph	indicators
0	< 1 mph	smoke rises vertically
1	1 to 3	smoke drifts
2	4 to 7	wind felt on face, leaves rustle
3	8 to 12	leaves in constant motion
4*	13 to 18	dust raised, branches moving
5*	19 to 24	small trees sway,

* censuses should not be conducted

Contact Person and Observers: Permanent address and full names.

Species: Use current AOU checklist (AOU 1983) and subspecies if discernible (AOU 1957). Four letter BBL code preferred.

# of individuals: Use S, V, C, (prioritized, see below) for each individual encountered:

1: S = full male song
2: V = visual, bird seen
3: C = bird heard calling only

Priority for which code to use should follow S,V,C. For example, if you first see an individual (V), then hear it call (C), and after a few minutes it sings a male song (S) the only code recorded on the form would be an "S". If you see a bird (V) and it is calling (C) the only code recorded would be "V".

Total: The total number individuals of each species encountered.

Breeding: Check each column if any individual of the species is doing the following:

Pair: Two birds believed to be a mated pair; courtship behavior observed.
Cop: Copulation observed
Carry:nest mat.: individual observed carrying nest material.
food: individual observed carrying food.
Nest Obs: Active nest observed.
Fled.: Dependent fledgling observed. Juvenile must be observed being fed by adults or begging.

AREA SEARCH FORM

Entered: ____

Date: ________

Page Number: ___

Location: ______________________________ Site: ________ Plot #: ____ UTM: ____

Start Time: ________ End Time: ________ Weather: TA: _____ Sky: ____ Wind: ___

Contact Person: ______________ Phone: (   ) ___-____ Address: ____________________

____

Observers: ______________ ______________ ______________ ______________

Species	# of individuals (Song, Visual, Call, one letter per individual)	Total	Breeding		Carry			
			pair	cop.	nest mat.	food	nest obs.	fled.

Notes: ____

____

____

gbe-93